ABSTRACT OF THE DISCLOSURE

An autoclave reactor allows for the ultrasonic analysis of slurry concentration and particle size distribution at elevated temperatures and pressures while maintaining the temperature- and pressure-sensitive ultrasonic transducers under ambient conditions. The reactor vessel is a hollow stainless steel cylinder containing the slurry which includes a stirrer and a N_2 gas source for directing gas bubbles through the slurry. Input and output transducers are connected to opposed lateral portions of the hollow cylinder for respectively directing sound waves through the slurry and receiving these sound waves after transmission through the slurry, where changes in sound wave velocity and amplitude can be used to measure slurry parameters. Ultrasonic adapters connect the transducers to the reactor vessel in a sealed manner and isolate the transducers from the hostile conditions within the vessel without ultrasonic signal distortion or losses.